N.A.C.A. BULLETIN

In Two Sections

Section One

ACCOUNTING DURING INFLATION AND DEFLATION
by PERRY MASON 933

STANDARD COST SYSTEM—POSTWAR MODEL
by WILLIAM E. PERRY 941

COST ACCOUNTING'S ROLE IN MANAGEMENT
by F. J. CARR 962

VOL. XXVIII, NO. 15 APRIL 1, 1947

EDITORIAL DEPARTMENT NOTE

The relationship of accountants to management and vice versa continues to occupy the minds of many writers and speakers. Each one emphasizes certain points so that in time a pattern should emerge outlining more clearly the various facets of this topic. In the first article, the author is disturbed by our present unstable economy and examines accounting from the point of view of the help it might offer to management in guiding the business through these uncertain times.

PERRY MASON, the author of this article, is well known in academic and N. A. C. A. circles. He is Associate Dean as well as Professor of Accounting at the School of Business Administration of the University of California. He holds a Ph. D. degree, is a C.P.A., and has had a varied career in teaching and public accounting. He is currently serving the San Francisco Chapter as its Director of Publications.

•

What accountants can do for management is concretely presented in the form of a case study on standard costs. This is the postwar model of a standard cost system used for quite some years by the company under consideration.

WILLIAM E. PERRY, the author of this article, has contributed many articles to our *Bulletins* and Year Books. The latest, on distribution costs, appeared in the February 15, 1947 issue. He is Comptroller of the Scranton Lace Co. and National Vice President of N. A. C. A. Both as author and as Vice President, he has made many friends throughout the Association.

•

The last article in this issue deals even more specifically with the relationship between cost accounting and management. It is lively and refreshing, and contains much sound advice on the specific ways in which the cost accountant can increase his usefulness to management.

F. J. CARR, author of the third article, is Controller of the Mallinckrodt Chemical Works since April 1946. He has had an active career in industry, having held positions as Treasurer or Controller of various companies, including the Aviation Corporation and American Air Lines. He was the first Controller of the Tennessee Valley Authority and was at one time Vice President in charge of Finance of the American Steel & Wire Co., a U. S. Steel subsidiary.

This *Bulletin* is published semimonthly by the National Association of Cost Accountants, 385 Madison Ave., New York 17, N. Y. Subscription price, $10.00 per year. Entered at the Post Office, New York, N. Y., as second-class matter August 28, 1925, under the Act of March 3, 1879.

COPYRIGHTED BY THE
NATIONAL ASSOCIATION OF
COST ACCOUNTANTS
APRIL 1, 1947

ACCOUNTING DURING INFLATION AND DEFLATION

by PERRY MASON, Associate Dean and Professor of Accounting,
School of Business Administration, University of California,
Berkeley, Cal.

THERE are various causes for and, therefore, various types of inflation and deflation, but for the purpose of this paper I shall accept a simple definition of inflation as a period in which prices *in general* are rising rapidly; and it follows that deflation is a period during which prices *in general* are falling rapidly. We are always in a period of price changes, but serious problems are created when most prices change in the same direction at the same time and tend to move up or down at an accelerating rate. It is a matter of speculation as to whether we are approaching a condition of serious inflation, but there certainly are a number of danger signals. We know that prices have advanced noticeably during the past few years. Although some prices are falling at the time this paper is being written, economists are still concerned about the possibility of price inflation after the present recession is past. We know that we are in for continued demands for higher wages which inevitably lead to higher costs which lead to higher prices. It is entirely possible that we shall wind up in an inflation spiral which will get out of control. There are many evidences of uncertainty as to price trends. Universities, for example, have been granted, for badly needed new buildings, millions of dollars which they have been unable to spend, primarily because contractors do not dare to make bids on construction projects. It seems clear that we are headed for plenty of trouble even though the pattern and the timing are hazy. It is appropriate, then, to give some thought to accounting problems accompanying rapid price changes.

These accounting problems fall largely into the field of the interpretation of accounting data: (1) profits are misleading; (2) costs of operation and production give improper guides to managerial policy; (3) budget preparation is hampered; and (4) balance sheet and income statement comparisons lose their usual significance. In general, conventional accounting figures lose their normal meaning and conclusions drawn from them can be dangerously deceiving.

People who try to live on fixed incomes do not have to be told that the dollar changes in value. My son insists that he must have

a larger allowance because it costs him twice as much as it did last year to take his girl friend out for dinner and a dance. Our wives can testify vividly and at length to the effect of higher prices on the food budget. We can also remember that during the depression of the thirties when prices were low a dollar went a lot farther, and even a cut in salary did not mean a cut in the standard of living. We feel happy about a raise in salary and gloomy about a cut, but we soon find that the actual test is the effect upon our real income, the amount and quality of food, clothing, entertainment, and recreation that our salaries will buy. The effect of a salary raise or cut depends upon what is happening to the purchasing power of a dollar.

Interpreting Profits

Just as an individual has to interpret changes in his personal income in the light of the changes in the price level, so the owners and managers of a business have to interpret net profits with some caution. One of the best ways I know of to start an argument is to pose this question: if a merchant buys goods for $100 and sells them for $150, and then replenishes his stock of goods at a cost of $120, is his profit $50 or $30? Or, if he replaces the goods at a cost of $90, is his profit $50 or $60? The conventional accounting answer is $50 in both cases, but one can make a good argument for the point that net income should represent the power to obtain goods and services over and above what we had when we started and that it is meaningless to talk about profits until the original "real" capital has been maintained.

If a seller is in a position to fix the price of his product and ignores cost-price fluctuations he will find that his price is too low, if costs have risen, since it will not enable him to replace the items sold and leave him a reasonable profit. If costs have fallen, his price will probably prove to have been too high since he could have lowered the price, increased his volume of sales, replaced his goods, and still have had a good margin of profit and higher total profits than if he had not lowered his prices. If the price of the product is determined by competitive market conditions, a seller is cutting his own throat if he indulges in price cutting when prices are rising even though his profit appears to be high, since he will be short of funds to replace his goods and will have to follow the market down when prices are falling.

The profit figures which emerge from our accounts may also be

misleading as to the desirability of expansion. Suppose that an investment of $100,000 in a business appears to yield $20,000 of net income or a return of twenty per cent. If it would now cost $200,000 to replace all the assets of the business, the rate of return is actually only ten per cent and the chances are that even the $20,000 is overstated for this purpose since it was calculated with deductions for depreciation and other expenses based upon costs which are now markedly higher. When prices are falling, the situation may be equally confusing. A business may appear to be earning a low rate of return on its capital investment or even to be losing money, when, if current costs were brought into the picture, expansion might well be indicated as having very profitable possibilities.

And to cap the climax, we pay income taxes on conventionally computed accounting profits. We are taxed heavily when the profit figure is inflated and we need more and more dollar capital merely to hold our own on the treadmill, let alone actually making any real progress; and when profits are actually higher than they appear to be and we could easily spare the money, our taxes are low.

The net profit figure, then, cannot be taken at face value during periods of rapid price changes. Perhaps we can put it this way: the cost of replacing the goods which have been sold must be provided for before any *distributable* profits can be recognized. When prices are rising, dividends must be restricted or new capital must be obtained in some other way to finance the increasing cost of replacing goods which have been sold and equipment which has worn out. When prices are falling, dividends can safely be increased over the amount of net income shown by conventional accounting calculations (assuming the presence of sufficient earned surplus to make the dividend legal), since the capacity of the business to make or sell goods can be maintained with a smaller amount of capital funds than before.

Costs of Operation

Not only are profit figures hard to interpret when prices are changing rapidly, but costs of operation and production lose much of their significance as guides for the management in making policies and decisions. The costs which emerge from the cost accounting system are out of date before they can be put into reports and schedules. They cannot be used as guides to a price policy. They cannot be used for comparison of alternative methods of produc-

tion. They are complex mixtures of depreciation and other costs based upon historical figures which, in view of the accelerated price changes, can well be called ancient history, together with items such as current labor costs, which represent an entirely different price level period. Standard costs get into serious difficulties as dollar variances get out of hand.

Reproduction Cost

Our experience with the price of used automobiles during the past few years is a good example of what happens to practically everything during a period of inflation. A car which cost $1,000 in 1940 could probably still sell for $1,000 or more. If we follow the conventional practice of charging depreciation at, say $250 a year, the first four years carry a depreciation charge, the years since 1944 would be charged with nothing, and if we now sell it or trade it in, we show a gain of $1,000. Or, we might take the attitude that it doesn't cost anything to own a car these days. You buy a car for $1,000, use it for several years and sell it for at least as much as you paid for it. The whole thing takes on a fantastic Alice-in-Wonderland appearance. A more realistic approach might handle the situation this way. The cost of owning an automobile depends upon current cost figures. At the time we bought the car for $1,000 it appeared reasonable to assume that it would be scrapped in four years, and $250 was a reasonable depreciation charge. If, in the next year, the same car would sell on the used car market for $1,000, but in view of the difficulty of getting new cars, it appeared that such a car would be used for five years more, the depreciation charge on our own car might well be reduced to $200. Then in the third year, if the price was still $1,000 with an estimated remaining life of four years, the depreciation charge might well be increased to $250, and so on. This would divorce depreciation charges from original cost, but it would give a better guide for current policy decisions. If we are considering selling our fleet of delivery trucks and resorting to public delivery service, the decision is based upon present costs of used or new trucks not upon our original costs. If we are working out a schedule of delivery charges to different towns and areas, it is present costs not original costs which must be taken into account.

I believe we have always recognized that while the original cost basis can be defended as the most practical and feasible basis for accounting purposes, we would have to resort to special cost studies

which took current costs into account, when we came to specific managerial decisions. The point, then, is that during inflation or deflation conventional accounting figures based upon original dollar costs tend to lose their significance rapidly and even to become dangerously misleading.

Budget Difficulties

Pity the poor budget maker during these times. I recently listened to a pathetic story as a county auditor presented the difficulties of trying to work out and administer a governmental budget during periods of rising prices. The old figures of experience are merely a jumping off point into the uncharted sea of speculation as to where prices are going. Quantity variations are still valid, but comparisons of dollar figures become more and more meaningless and ineffective.

Balance Sheet Comparisons

Statement interpretation and comparison are greatly handicapped during these periods of inflation and deflation. It has been said that one advantage of using original cost as a basic accounting valuation principle is that the balance sheet figures are homogeneous—they all were computed in the same way and represented the same thing. In periods of rapidly changing prices, however, these cost figures are anything but homogeneous. They are a hodge podge of costs representing varying price levels and, therefore, varying amounts of real purchasing power and effort. Suppose that the business has four buildings, one built in 1915, one in 1928, one in 1934, and one in 1945. The balance sheet shows one figure for the cost of buildings—$850,000. It is likely that if all four buildings had been constructed in 1946 the cost would be $1,850,000. The balance sheet may indicate how many dollars the firm has put into buildings at various times but such information is of little value. It is important to know whether or not a firm is expanding its plant through the years, but an increase from $1,000,000 to $2,000,000 may actually represent no physical increase at all. Current assets tend to be expressed in figures which are much closer to present-day prices. Any conclusions which are drawn as to the relative amount of capital required to finance the fixed assets must take into account the period in which the assets were first acquired. Price changes, then, make it difficult to compare groups of figures in any single balance sheet and studies of comparative

balance sheets mean little unless some adjustment is made for the difference in the meaning of the dollar from one period to another.

Limitations of Profit and Loss Statement

The current income statement, except for such items as depreciation, can be used without too much difficulty if the period covered is relatively short, such as a month or a quarter, since the items largely reflect current costs and prices. Comparisons from one period to another, however, may be of dubious significance. The dollar sales may be doubled but the actual sales in terms of physical units may not have changed or may even have dropped. The dollar net income may have doubled but in terms of what this net income means to the business or to the stockholders or owners as purchasing power, they may be no better off or even worse off than they were in the prior year. Or, the dollar net income may be the same, and if the business is operating in a period of falling prices it actually may be doing very much better than it did in the prior year.

Interpreting Accounting Data

So much for some of the difficulties we encounter during these periods of rapid price changes. Now, what can we as accountants do about it? In the first place, and most important of all, we must realize ourselves what is going on and do our best to explain to management the significance or lack of significance of the current financial statements. We should not sidestep our responsibilities on the ground that we are not valuers, or appraisers, or prophets, and should not insist that all we can do is account for original costs and leave the rest to management. We should assume the role of interpreters to management and owners of accounting data, and be the first to point out the limitations of the figures which emerge from the accounts. The assertion that in our opinion the financial statements have been prepared in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year becomes little more than a bit of mumbo-jumbo in periods of rapidly changing prices. How can we be consistent with previous periods when the value of the dollar takes a big jump one way or the other? We should warn management that, in periods of rapidly rising prices, profits are not as large as they appear, and that in periods of rapidly falling prices net losses are not as large as they seem to be. We should be prepared to co-

operate with management in the calculation of alternative figures which do reflect to the best of our ability current conditions.

Physical Quantity Data

There are some things which can be done in connection with the cost accounting methods. We should encourage the use of standard cost methods and the basing of depreciation upon production and use rather than upon the mere expiration of time, since these devices tend to take care of the variations in productive activity which so often accompany severe price changes. We should emphasize the point that during these periods when dollar figures lose so much of their significance, physical statistics of production become the only valid tests of what is going on. It is the number of units of product sold not the dollar sales that is important. It is the number of units turned out by a factory machine operator in a day, not the average unit labor cost, that tells whether or not efficiency is being maintained.

Effect of Price Changes

I do not like the last-in first-out method of arriving at the cost of an inventory, since it recognizes the significance of current costs at only one point in the entire accounting structure; it leaves the balance sheet figure at an ever increasingly obsolete point, and it smacks of manipulation with an eye primarily on the income tax return. Nevertheless, I have to admit that it serves a useful function during these periods of rapid price changes. It comes closer than any other method to reflecting current costs and closer to giving a true statement of costs of operation and of net income. We should emphasize the significance of the distinction between fixed and variable costs and be able to point out that in the matter of price policy average cost may be completely misleading, since it often goes down when prices are rising and up when prices are falling, due partly to the fact that many if not most fixed costs lag behind the general price trend and partly to the variations in production which so commonly accompany rapid price changes. It is a practical truth and no economist's ivory-tower pipe dream that it often pays to sell below computed average cost in depression periods.

Necessity for Appraisals

We have to take a more charitable point of view as to appraisals when we have suffered periods of rapid price changes. Appraisals

are not particularly useful during the periods of rapid changes, since they are out of date before they can be made and recorded, but once prices appear to have leveled off at a high or low point, we have in the past and we undoubtedly shall in the future give recognition to appraisals in the accounts. When present costs get too far out of line with original costs, we have to agree that only drastic reorganization of the accounts will permit us to provide management with information of the maximum degree of usefulness.

Analyzing Business Cycles

We as accountants ought also to be able to advise business management on the best methods of hedging against inflation and deflation. Not much can be done, but at least we can point out that when prices are rising every attempt should be made to get excess cash into material goods and equipment, and that when prices are falling just the reverse policy should be followed. Another point worth making is that liabilities carrying fixed obligations as to principal and interest offset the fixed claims on the asset side of the balance sheet. Dollars which we collect from customers do not lose or gain value if we can apply them on accounts or notes payable. Or, to put it another way, in analyzing the effect of price changes on the balance sheet, we can deduct the current liabilities from the current assets and consider only the difference. It is good policy to borrow when prices are rising and to get out of debt when prices are falling. Of course, we are as helpless as anyone else when it comes to the really critical question: when has the peak or the bottom been reached? There I believe we have to admit that accountants are no better guessers than anyone else.

COMING ARTICLES

In the *N.A.C.A. Bulletin*, April 15, 1947

The Case of a Standard Cost Plan
by THOMAS B. NOBLE

Fixed Charges in Inventories
by CECIL L. CLARK

Determination of Trucking Costs
by J. FRANK DICKSON, JR.

STANDARD COST SYSTEM—POSTWAR MODEL

by WILLIAM E. PERRY, Comptroller,
The Scranton Lace Co., Scranton, Pa.

THE plant which is the subject of this case study is of medium size, containing 560,000 square feet of floor area and employing approximately a thousand employees. It is a complete process textile plant manufacturing lace window curtains, lace dinner cloths, plastic shower curtains, and plastic window curtains. The line of merchandise offered consists of about 700 different patterns or styles which are sold throughout the United States in the retail, chain store, and catalog markets by our own sales force. The company installed its first standard cost system in 1922, its first operating budget in 1930, and its first plan of incentive compensation in 1933.

Since V-J Day we have spent considerable time revising and improving our cost system, so that it may now be referred to as our postwar model. The system, as is the case in most textile plants, is a process cost system. Its basic principles, however, are equally applicable in a system where job costs are required. The system provides not only for standard costs but also for operating budgets built upon and related to the standards. For orderliness in presentation the subject is divided into three parts, as follows:

1. Organization of the cost system
2. Setting the standards
3. Using the system for cost control

Organization of the Cost System

General Framework

The business is divided into three operating divisions—factory, administrative, and sales. Next, each of these divisions is departmentalized so that there is a distinct segregation of costs for each foreman, chief clerk, or department head.

In the factory division the departments fall into three classes:

1. Productive departments
2. Service departments
3. Cost pools

The first two are self-explanatory, but I should like to comment briefly on the cost pools. These pools are not existing physical

units, such as a boiler room or a stores department; they exist only on paper, but they are the place in which we accumulate such costs as depreciation, insurance, taxes, supervision, etc.

Account Classification

The account classification in Exhibit 1 is the postwar model. By using a combination of letter prefixes and numbers we have attempted to have the account number give some indication of the account name. There are two main divisions used in this numbering system, (1) the major account, and (2) the detail cost or expense. In the major accounts the letter prefix indicates the subsidiary ledger. In the center of the exhibit page there is a typical list of factory departments, each using the F prefix. A dash is used to indicate the break between the major account and the detail cost. The letter prefix to the right of the dash indicates the general class of cost. We use the three generally accepted divisions—labor, material, and burden—although for better identification we have split labor into four sections. Each of these divisions is supported by an alphabetical listing of all of the major types of labor, material, and burden. Each major item of cost is in turn supported by a list of every detail item used. These detail items are shown by using a decimal point, and then subnumbers which indicate the specific item. An extract from the materials account classification appears at the bottom of Exhibit 1.

The identification numbers assigned to labor and material items in the account classification are used in the payroll, production planning, stores, and personnel departments as well as in the accounting department. All labor tickets issued and all material requisitions use these numbers in place of written descriptions. It is a master code to serve all operating purposes and it is capable of considerable expansion without becoming obsolete.

Setting the Standards

Normal Capacity

Building the standard costs is usually done once a year, the job being completed so that the opening inventory of the fiscal year can be priced at the new standards, and that current operations for the ensuing fiscal year can be measured against the same standard costs.

TNE ACCOUNT CLASSIFICATION

KEY TO NUMBERING SYSTEM

Major Account			Item of Cost				
Ledger Prefix		Department	General Class		Type		Detail Item
General	- G	In each ledger the depts. are numbered from 1 up.	Labor - Piece	- P	Labor job classification. Alphabetical order.	.	Labor - overtime, make-up pay, etc.
Factory	- F		Labor - Time	- C			
Administrative	- A		Labor - Salary	- X			
Sales	- S		Labor - Taxes	- W			
			Materials	- M	Materials by groups. Alphabetical order.	.	Material - each item numbered.
			Burden	- B	Burden by name. Alphabetical order.	.	Burden - each item numbered.

Examples of Account Coding

Factory Ledger	Boiler	-	Labor - Time	Fireman	.	Overtime Pay
F	30	-	C	920	.	1
Factory Ledger	**Bleach & Dress**	-	**Material**	**Chemical**	.	**Soda, Silicate**
F	45	-	M	9	.	10

DEPARTMENTS - FACTORY

Cost Pools		Service Depts.		Productive Depts.	
Space & Equipment	F1	Boiler	F30	Yarn Prep.	F42
Repairs & Alterations	F2	Maintenance	F31	Weave	F43
Supervision, Mill	F3	Machine	F32	Brown Mend	F44
Experimental	F4	Stores	F33	Bleach & Dress	F45
Cost Clearance	F5	Sewing Mach.	F34	White Mend	F46

ITEMS OF COST - MATERIALS

Paper	M34	Roll Covers	M36
Bond, 16# Blue	M34.1	Duck #12 - 66"	M36.1
" , 16# Buff	M34.2	" " - 74"	M36.2
Corrugated, 19½ x 40	M34.3	Felt, Table - 54"	M36.5
Draughting	M34.4		
Tape, Kraft, Gummed	M34.5	Soap	M40
Tissue, Blue Facing	M34.6		
Towels	M34.8	Chip, Saratoga	M40.1
Wrapping, 50#, 30 x 40	M34.10	Paste, Modinal	M40.2
		Igepon, Powder	M40.3

EXHIBIT 1.

NORMAL CAPACITY PRODUCTION

Standard Normal Capacity Plant	Cost Centers		Equivalent Production Units Pattern No.	Rack Yards	Units	
1,000,000 rack yards	Warping	312 mch. hrs.	9,900	250,000	50,000	pairs
	Winding	3,050 " "	9,901	400,000	82,000	"
	Weaving	1,000,000 rk. yds.	9,902	75,000	4,000	covers
	Mending	1,076 mch. hrs.	9,903	25,000	2,000	"
	Sorting	505 man hrs.	9,904	50,000	12,000	pairs
	Kiering	3,060 mch. hrs.	9,905	100,000	32,000	"
	Starching	5,080 " "	9,906	100,000	6,000	covers
				1,000,000	188,000	

OPERATIONS REQUIRED TO PRODUCE

NORMAL CAPACITY

YARN PREPARATION DEPARTMENT

Normal Capacity Pattern	Normal Capacity Units	Warping Cost Center Operation No.	Warping Cost Center Units per Pattern	Warping Cost Center No. of Operations	Winding Cost Center Operation No.	Winding Cost Center Units per Pattern	Winding Cost Center No. of Operations
9900	50,000	04	.010	500	01	.05	2,500
9901	82,000	01	.020	1,640	04	.10	8,200
9902	4,000	02	.010	40	02	.10	400
9903	2,000	02	.005	10	03	.05	100
9904	12,000	03	.010	120	04	.20	2,400
9905	32,000	01	.020	640	03	.10	3,200
9906	6,000	04	.005	30	02	.05	300
	188,000			2,980			17,100
Recap		01	(times required)	2,280	01	(times required)	2,500
		02		50	02		700
		03		120	03		3,300
		04		530	04		10,600
				2,980			17,100

EXHIBIT 2.

The starting point is the determination of standard normal capacity for the entire operation. The basic information developed is shown at the top of Exhibit 2. We have adopted a policy of setting normal capacity on the basis of a business cycle rather than using a different basis for each year. In our mill the weaving machines (looms) determine the output and the unit used to express plantwise production capacity is the "rack yard" (in Exhibit 1 it is 1,000,000). In addition to setting normal capacity for the plant as a complete producing unit, we also set a normal capacity for each of the factory cost centers, these being properly related to the plant-wide normal capacity. All standard costs are built on the basis of the normal capacity setup.

After normal capacity is established we next translate it into specific items of product to be manufactured in the ensuing period. Past production records furnish statistics as to the "rack yards" made in each of the 700-odd patterns in the line. These data are then adjusted for new patterns to be added, discontinued patterns, changes in manufacturing specifications, etc. The final result is the number of units of each pattern expected to be produced at normal capacity level. In Exhibit 2 it is 188,000 units.

Our next job is to analyze these units per pattern so that we can express normal capacity in terms of the quantity of work each cost center in each factory department will have to perform in order to turn out the expected units of production. It is to be remembered that detail factory operation is used both for measuring work and setting standards costs. In other words, how many times will each of the various operations in each cost center have to be performed at normal capacity level? The procedure followed is demonstrated in the bottom part of Exhibit 2. The production department's specifications sheet shows the operations which each pattern must pass through in each cost center in the course of manufacture. When this has been done for all cost centers, normal capacity has been translated into quantity of work to be performed. We know how many times each operation in the entire factory must be performed to turn out our normal standard capacity of 1,000,000 rack yards.

Standard Rates and Prices

The next phase in building the standards is to determine what it should cost at normal capacity level to get this work done. The first step in determining cost is to establish the expected levels of wages and material prices. The wage schedules of the payroll department are reviewed and any planned changes are incorporated therein. In our standard cost work we generally use the maximum rates on each job classification on the premise that any employee receiving less than maximum is not performing at top efficiency. On raw and direct materials the purchasing department forecasts the expected prevailing price on each item in the ensuing period. All standard wage rates and all standard material prices are approved by the executive committee. The latter also reviews the burden accounts and decides what shall be included in the standard costs.

Standard Operation Rate Sheets

The first standards cover the detailed operations in each cost center. In our plant there are approximately 1500 operations. The basic principles of the standard operation rate sheet which we use are shown in Exhibit 3. The top of the form shows a description of the operation, each item of cost going into it, and the standard quantities of each.

The standard time allowed (in hours) on time work operations, the quantity allowances on all direct materials, and the total machine hours or other basis of burden application were all set when the operation was first initiated. The new standard wage rates and material prices are applied to these standard quantity allowances and extended to standard dollar cost. The auxiliary labor is applied on each rate sheet as a percentage of the direct labor. The development of the standard burden rate for each cost center will be covered a little later in our discussion.

In passing, I might say that the burden may be applied (1) as a per cent of labor cost, (2) on machine hours, and (3) on production units, whichever best suits the circumstances. In all cases the burden rate is based on the normal capacity of the cost center and if the current work program is below that level, the difference is charged to a temporary idle facilities account.

In all cases the production unit used as the basis of the operation rate sheets is that commonly used in the cost center as the unit of work. In the exhibit a warp is the production unit used for the operation rate sheet. However, since many individual pairs of curtains in different patterns may come off this warp, on the bottom of the operation rate sheet we develop the portion of the cost which will be absorbed by each pound of yarn in the warp. This cost per pound can be applied on the pattern cost sheet.

Pattern Cost Sheets

Exhibit 4 shows a standard cost sheet for one pair of curtains, pattern 9900. The raw material or cotton yarn content is determined from standard allowance tables, which were prepared on the basis of actual tests and which are continuously rechecked. The rest of the pattern standard costing is quite simple. We list the operations through which it must pass in the course of manufacture, and the units in the pattern, and apply the rates directly from the detail operation rate sheets. The actual pattern cost sheet is in considerably more detail than the one in the exhibit.

OPERATION STANDARD RATE SHEET

Warping Cost Center — Operation No. 01

Description - 3,000 yard warp, 3,600 ends, 20/2 yarn, 6 ends per inch, sleyed
High Speed Warper No. 2 - Weight 998 pounds.

Item of Cost	Account No.	Standard Quantity	Standard Price-Rate	Standard Cost
Labor - Direct				
Warper	P170	6.2 hours	$1.90	$11.78
Jacks, filler	P430	1.½ "	1.20	1.32
Threader	P160	1.2 "	1.50	1.80
				14.90
Labor Auxiliary				
Handler	P710	On Direct Labor	5%	.74
Hander-up	G430	" " "	6%	.89
Taxes, Social Security	W30	" " "	4%	.60
Vacation Award	W15	" " "	2%	.30
				2.53
Material				
Paper, Wrapping 50# 30" x 40"	M34.10	10 sheets	$ .01	.10
				.10
Burden				
Machine Hours		6.2 hours	2.00	12.40
Total Standard Cost				$29.93

Application to Pattern Cost

Pounds of warp yarn in pattern $29.93 ÷ 998# = cost per pound $.03

EXHIBIT 3.

PATTERN STANDARD COST SHEET

Pattern No. 9200

C. C. No.	Raw Mat'l / Manuf. Oper'ns		Oper'n No.	Units in Pattern	Stand. Rate	Stand. Cost
	Raw Material					
	Warp Yarn	20/2		.90 lb.	$.25 lb	$.225
	Spool Yarn	30/2		2.00 "	.30 "	.600
	Bobbin Yarn	70/2		.10 "	.50 "	.050
	Operations					
01	Warping		01	.90 lb.	.03	.027
02	Winding		02	2.00 "	.06	.120
03	Bobbin Prep.		02	.10 "	.15	.015
04	Weaving		17	1.20 rks	.20	.240
05	Bleach		04	5.00 yds	.04	.200
06	Dye		10	3.00 yds	.06	.180
07	Hemming		03	6.00 yds	.005	.030
08	Packaging		12	1.00 ea.	.04	.040
Total Standard Inventory Cost of Pattern						$1.727

EXHIBIT 4.

Department and Cost Center Standards

As we construct the departmental costs we also show the spread of that cost over the various cost centers which are included therein. On separate working papers (not shown as an exhibit) we set up the detail operations and the number of times they must be performed at normal capacity level. From the operation rate sheets, we apply the standard cost for each item of direct labor

and direct material and work out the dollar cost at normal capacity level. The total figures thus obtained for each cost item are carried over to the department standard cost sheet shown in Exhibit 5.

On auxiliary labor, sundry supplies, and burden a reverse procedure is used. These items are determined for the whole department on this record and then spread over the cost centers. The percentage of auxiliary labor to direct labor used on the operation rate sheet is determined here. The standard burden rates for each cost center are also determined on this sheet. If burden is applied on the labor dollar, the ratio is that shown on this departmental sheet. Note particularly that all of the burden shown is a proration from a cost pool or service department. In our 1946 setup we have no direct burden charges in the productive departments, as we have come to the conclusion that all factory burden should first be accumulated in the service departments and cost pools for cost control purposes, and spread or prorated over the production departments only for the purpose of building standard costs.

When all of the departmental cost sheets have been finished a summary is prepared listing all the factory departments. This summary shows the total standard cost for the entire operation at normal capacity level. Thus, suppose that by departments this summary showed a total cost of $400,000 for a standard month. If we were to take all plant detail operations and multiply by the standard operation costs we would also come to a total cost of $400,000. Also, if we took the quantity on each pattern and multiplied by the standard pattern cost, we would total out at $400,000.

From the point of view of day to day work, there is a great deal of time saved by having the standard costs built three ways. Because they were derived from the same basis, they can be used interchangeably. For example, plant production can be costed on an operation basis when charged into goods in process. This same account can be credited for goods finished on a pattern cost basis. It permits handling each phase of the work on the easiest basis possible. Next, I would like to point out that profit crossover charts, sales realization standards, cost of operation forecasts, and pertinent factors for the financial budgets are readily available from this type of cost system. I presume that by this time you have also guessed that the cost system is tied into the general books and is the basis of our whole general accounting system. All inventory and cost of sales accounts are carried at standard costs. Our standard cost system is interwoven with production planning,

DEPARTMENT STANDARD COST SHEET

YARN PREPARATION DEPARTMENT

F 42

Item of Cost	Account No.	Department Total	Allocation To Cost Centers	
			Warping	Winding
Labor: Direct				
Winder, Spool	P181	$1,700	$	$1,700
Winder, Warp Spool	P182	140		140
Threader	P160	290	290	
Warper	P170	1,000	1,000	
Jacks, filler	P430	150	150	
		3,280	1,440	1,840
Labor, Auxiliary				
Backwinder	G405	100		100
Handler	F710	400	72	328
Hander-Up	G430	90	90	
Taxes, Social Security	W30	155	64	91
Vacation Award	W15	80	29	51
		825	255	570
Materials, Direct				
Paper, Wrapping	M34.10	100	100	- o -
		100	100	- o -
Materials, Department				
Sundry Supplies	M44	20	- o -	20
		20	- o -	20
TOTAL		$4,225	$1,795	$2,430
Burden Pro-Rated				
Space & Equipment	F1	700	300	400
Supervision, Mill	F2	400	175	225
Boiler	F30	100	50	50
Maintenance	F31	100	50	50
Stores	F33	50	50	
		1,350	625	725
TOTAL		$5,575	$2,420	$3,155

EXHIBIT 5.

payrolls, and factory storekeeping, and this contributes a great deal toward efficient and coordinated operations.

Budget Standards

Having finished the annual job of building the standard costs, we can now turn to the annual job of setting the budget standards. In our operating budget we provide a budget allowance for every single item of cost in every department throughout the entire company. As a result we have really a budget ledger, divided into departments, with a card under each department for every item of cost which occurs therein. One of these cards is shown in Exhibit 10—for the handling of cost in the yarn preparation department.

Our budget standards are built upon our standard costs, so we first have recorded in detail exactly what went into the standard costs. When we start to build our budget our purpose is to get a budget allowance for each item at levels of operation ranging from 50 per cent to 150 per cent of normal capacity. Our first premise is that at normal capacity the budgets and standards are identical. A committee composed of the operating executive in charge, the foreman of the department, and the cost accountant then determine the budget allowance for all other levels of operation. They operate under a prescribed set of rules to insure uniform treatment to all foremen. When the committee has finished its work, the variable budget standards for all lines of operation are set for the coming year.

Using the System for Cost Control

Principle of Cost Control

Building the standards is an annual job; controlling costs is a continuous, current proposition. In building standards it is necessary to record costs in such a manner that they can be properly applied to the product being manufactured; the various cost items are usually charged to the foreman or department receiving the ultimate benefit. If it is not an item which can be charged directly then we prorate or allocate it to the ultimate beneficiary or the point where cost is applied to the product. This prorating procedure must be followed in building standard costs but it does not have to be followed currently for controlling costs. In controlling costs, best results can be secured if the items of burden cost are allowed to remain in the cost pools and service departments.

In other words, we make no prorations of burden costs in our month-to-month accounting. Let me give some examples:

1. Foremen's salaries. The foreman gets the ultimate benefit of his own efforts and for standard cost purposes we charge his salary to his department by prorating the mill supervision cost pool, and it is recovered from the products manufactured. But the foreman does not set or control his own salary. Therefore, for cost control purposes it is charged to the mill supervision cost pool, which in turn is charged to the operating executive responsible for the number of foremen and the salary they receive.
2. Another example might be repairs made in a production department by a mill maintenance crew. For standard costs this item is charged by proration to the production department whose equipment was repaired. But the production department foreman does not control the men who make the repair nor does he order the materials required. This is done by the foreman of the maintenance gangs. He is responsible for the cost of the repair. Hence, for cost control, he receives the charges.

Our postwar standard cost system has been set up so that all items of cost are in the first instance charged to the person or department responsible for incurring or controlling the cost. In productive departments all labor and material are presumed to be under the control of the foreman. But note that in productive departments the foreman does not incur or control any burden items. Therefore, all factory burden items are charged to the person who does incur or control them, by the use of cost pools and service departments. For establishing standard costs all burden accumulated in cost pools and service departments is prorated to the productive departments. In all current cost control work such as the cost ledgers and budgets, no prorations or allocations are made. The costs in every instance are charged to the person and department responsible for them, and there they stay.

Cost Covered by Standards

Now let us review a current monthly closing procedure and see how this system works out. We record all actual cost incurred by items in great detail in our factory ledger. When all posting is finished the productive departments' ledger cards show labor and

STANDARD COST & VARIANCES

BLEACH & DRESS DEPT.

P 45

Earned by Standards

Cost Center & Opr. No.	Operations Performed	Labor Std. Rate	Labor Amt.	Material Std. Rate	Material Amt.	Burden Std. Rate	Burden Amt.
Bleaching							
01	860	$.90	$ 774.	$.60	$ 516.	$.50	$ 430.
02	40	.95	38.	.50	20.	.40	16.
03	116	1.00	116.	.60	70.	.60	70.
04	90	1.50	135.	.40	36.	.70	63.
	1,106		$1063.		$ 642.		$ 579.
Kiering							
01	480	$.25	$ 120.	$.03	$ 14.	$.40	$ 192.
02	460	.20	92.	.04	18.	.35	161.
03	3,050	.30	915.	.04	122.	.50	1525.
04	4,720	.40	1888.	.06	284.	.70	3304.
	8,710		$3015.		$ 438.		$5182.
Sorting							
01	500	$.10	$ 50.	-	-	$.05	$ 25.
02	260	.08	21.	-	-	.04	10.
	760		$ 71.				$ 35.
Total Earned Standards			$4149.		$1080.		$5796.
Total Actual Cost			$4098.		$1046.		
Labor Variance			$ 51.		-0-		For burden variance See Exhibit No. 7.
Material Variance			-0-		$ 37.		

EXHIBIT 6.

Burden Cost & Variances
Entire Factory

Burden Earned by Standards in Productive Departments		
Yarn Production	$1,400	
Weave	8,000	
Brown Mending	2,000	
Bleach and Dress	5,796	
White Mending	3,000	
Finish	2,600	
Wrap	2,200	
Ship	1,800	$26,796
Actual Burden Cost for Period—Cost Pools and Service Departments		
Cost Pools—		
Space and Equipment	$ 6,000	
Supervision, Mill	4,800	
Service—		
Boiler	4,500	
Maintenance	5,500	
Machine	2,600	
Stores	1,100	$24,500
Variance Gain		$ 2,296

EXHIBIT 7.

material costs incurred. All the actual factory burden costs have been accumulated in the cost pools and service departments. Exhibit 6 shows to what extent actual costs have been covered by the standard costs. We start this part of the work by securing for each cost center in each department the number of times each operation was performed. By applying the total labor, material, and burden rates from the respective rate sheets, we determine the amount covered by the standard costs. This is compared with the total actual labor and material costs, and variances from standard are determined. In the exhibit we have determined the amount of burden covered by the standard costs for this department. This is carried over to Exhibit 7 where, by adding similar totals from other productive departments, we secure the total burden earned for the factory as a whole. In dividing the plant

into departments, we generally try to follow the natural breaks in the manufacturing processes, and also to observe the jurisdictional limits of the foreman. As a result we frequently find that a department includes more than one step in the manufacturing process. In such cases we divide the departments into cost centers, setting up a cost center for each battery of machines or group of employees performing the same kind of work.

The next important subdivision of cost is made in the factory cost centers. While only one general type of work is performed in a cost center, upon observation it will be noted that a variation exists in the handling of different product items passing through it. For a simple example, take the packing cost center where the various products are labeled and boxed. There are several different types of boxes and labels used, and anywhere from one to twelve units may be placed in a box. Each type of packing is a separate operation and each has a different cost. Therefore, in each cost center we make a further subdivision of cost; we break cost down so as to apply it against each of the detailed operations performed therein.

The framework of our cost system thus has been established. The factory has been departmentalized, the departments divided into cost centers, and the work flowing through the cost centers broken down into detailed operations. The next point concerns the "items of cost" recorded within this framework. Proper classification and recording of details of cost are a fundamental requirement for a good cost system. Our account classification provides a fine degree of detail in recording costs. It provides for recording 145 different job classifications of labor, 243 items of materials, and 96 items of burden cost. This detailed recording is used both in setting standard costs, recording actual operating costs, and in our budget reports. However, in our actual cost ledgers all burden rests in the cost pools and service departments, so we compare the total actual cost of this group against the amount earned in the productive department to determine our burden variance. For closing the books, all labor, material, and burden standards and variances are determined only in totals by departments.

Standard Cost Breakdown

Once the monthly closing is out of the way the cost department immediately begins preparation of the operating budget reports.

Since the budget allowances are primarily based on the standards, our first job is to break down the total labor, material, and burden earned by the standards into the respective component parts; or in other words, into detail items of cost. What we want to find out is how much did the standard earn on each item of cost? The procedure for breaking down the labor in the bleach and dress department is demonstrated in Exhibit 8, the cost breakdown sheet. Thus total operation costs are broken down into the detail items of cost and the standard cost on each item posted in its proper column. These rates are then applied to the monthly production on the various operations, and as a final result our total of $4,149 is broken down into the eight items covered.

The breakdown sheet for burden is shown in Exhibit 9. On the left side of the sheet are shown all the items of cost exactly as they were set up in the original standard costs, and the per cent that each is to the grand total of all burden. In the right-hand column at the bottom we have the amount earned by the standard costs on the current month's production, as developed on Exhibit 7. To break down this total earned burden for the month into items of costs, we apply the percentages developed on the normal capacity standards. This gives us the amount earned by the standards on each detail item of burden cost.

Once the cost breakdown work is complete and we have in hand the amount earned by the standards on every item of cost in every department, we have the starting point for setting the detail budget allowances.

Preparation of the Budget

The budget work is done in a separate cost department budget ledger, in which we have previously set the budget standards. In Exhibit 10, the actual cost of each item is posted from the factory ledger, the amount earned by standard costs is posted from the standard cost breakdown sheets. Simple comparison reveals the variation from standard. All of this is recorded in the columns on the right side of the card. The level of operation for the departments is determined by comparing the standard labor earned in the month with the normal capacity standard labor. Now we are ready to determine the budget allowance for the month. On those items of direct labor and direct material which vary in direct proportion to production, the budget allowance is the amount earned in the standard costs. On items of auxiliary labor, depart-

STANDARD COST BREAKDOWN - LABOR

BLEACH & DRESS DEPARTMENT

F 45

Opr.No.	Units of Prod.	Total Earned	Bleacher Std.	Bleacher Amt.	Tenterer Std.	Tenterer Amt.	Starcher Std.	Starcher Amt.	Dryer Std.	Dryer Amt.	Dryer Helper Std.	Dryer Helper Amt.	Joiner Std.	Joiner Amt.	Batcher Std.	Batcher Amt.	Handler Std.	Handler Amt.
P100.01	860	$ 774	.30	$258	.23	$198	.35	$301									.02	$ 17
.02	40	36	.30	12	.25	10	.38	15									.02	1
.03	116	116	.32	37	.26	30	.40	47									.02	2
.04	90	135	.55	50	.31	27	.60	54									.04	4
		1,063		357		265		417										24
P140.01	480	120							.13	$ 62	.11	$ 53					.01	5
.02	460	92							.10	46	.09	41					.01	5
.03	3,050	915							.15	458	.13	396					.02	61
.04	4,720	1,888							.21	991	.17	803					.02	94
		3,015								1,557		1,293						165
P220.01	500	50											.05	$25	.04	$20	.01	5
.02	260	21											.04	13	.03	8	.01	
		71												38		28		5
Total Labor		$4,149		$357		$265		$417		$1,557		$1,293		$38		$28		$194

EXHIBIT 8.

STANDARD COST BREAKDOWN - BURDEN

Standard Burden in Cost Pools & Service Departments Before Pro-ration to Production Departments.			Proportionate Amount Earned in Current Period
Dept. & Item of Cost	Amount	% of Total	
Space & Equipment			
Depreciation - Buildings	$2,000	8.08	$2,186
" Machinery	2,000	8.08	2,186
" Equipment	730	2.95	790
Insurance - Fire	100	0.40	107
" U. & O.	50	0.20	54
" Public Liability	20	0.08	21
Taxes - Property	500	2.02	541
Rentals - Building	500	2.02	541
" Machinery	100	0.40	107
	$6,000	24.23	$6,493
Supervision, Mill			
Foremen	$4,000	16.16	$4,330
" - Asst.	615	2.48	665
Taxes, Social Security	185	0.75	201
	$4,800	19.39	$5,196
Boiler			
Firemen	$ 700	2.83	$ 758
Engineer	800	3.23	866
Vacation Award	30	0.12	32
Taxes, Social Security	61	0.25	67
Coal, Barley	3,000	12.12	3,247
Water	200	0.81	217
	$4,791	19.36	$5,187
Maintenance			
Carpenters	$ 900	3.65	$ 978
Driver, Truck	150	0.61	163
Janitors	800	3.23	866
Laborers	400	1.62	434
Electricians	500	2.02	541
Watchmen	900	3.64	975
Vacation Award	73	0.29	78
Taxes, Social Security	146	0.59	158
Lamps	200	0.81	217
Repairs, Matls., Minor	1,300	5.25	1,407
	$5,369	21.71	$5,817
Machine			
Machinists	$1,600	6.46	$1,731
Machinists, Apprentice	300	1.21	324
Clerk, Storehouse	200	0.81	217
Vacation Award	42	0.17	46
Taxes, Social Security	86	0.35	94
Repairs, Matls., Minor	300	1.21	324
Tools	25	0.10	27
	$2,553	10.31	$2,763
Stores			
Storekeepers	$ 700	2.83	$ 758
Clerk, Storehouse	250	1.01	271
Vacation Award	14	0.06	16
Taxes, Social Security	29	0.12	32
Cord & Twine, Tying 10#	25	0.10	27
Labels, #283	100	0.40	107
" #284	50	0.20	54
Paper, Wrapping 30 x 40	70	0.28	75
	$1,238	5.00	$1,340
Total Standard Burden	$24,751	100%	
Total Earned in current period by Productive Department. Burden to be Pro-rated on above percentages.			$26,796

EXHIBIT 9.

OPERATING BUDGET

DEPARTMENT: YARN PREPARATION

Item: Handling No. G735

COST & BUDGET STANDARDS

Standard Costs

Detail	Units	Rate	Amount
3 employees @ 173 hours	519	.625	$324
Overtime	81 hrs.	.9375	76
			400

Variable Budget

% Oprn.	Committee Allowance Basis	Amount
50	1 employee @ 173 hrs. @ $.625	$108
60	2 employees @ 173 hrs. @ $.625	216
70	2 employees @ 173 hrs. = 346 hrs. @ $.625	216
80	3 employees @ 173 hrs. = 519 hrs. @ $.625	324
100	3 employees @ 200 hrs. = 600 hrs. @ $.625 / O.T.	400
130	4 employees @ 173 hrs. = 692 hrs. @ $.625 / O.T.	508
140	" " " " " " " "	508
150	" " " " " " " "	508

Budget Revisions

Date	Detail	Amount
3/1/46	General wage increase @ 15%	$ 60

CURRENT ACTUAL COSTS, VARIANCES, BUDGET ALLOWANCES

	% Oprns.	Earned	Actual	Std. Variance	Budget All.	Budget Var.	Other Var.
Jan.	130	520	485	35	508	23	12
To date							
Feb.	100	400	358	42	400	42	
To date		920	843	77	908	65	12
March	100	400	400		460	60	- 60
To date		1,320	1,243	77	1,368	125	- 48
April							
To date							
May							
To date							
June							
To date							
July							
To date							
August							
To date							
Sept.							
To date							
etc.							

Accounting Department Notes

EXHIBIT 10.

mental supplies, and burden items which do not vary directly with production, the amount to be allowed at the various levels is shown in the variable budget setup. The budget allowance is therefore made by the cost man according to the level of operation. Once the budget allowance is determined and posted in the column provided, the difference between it and the actual cost incurred is the budget variance. By subtracting this from the total standard cost variance we determine the variance arising from the level of operation.

In the lower left-hand corner of the card there is a space for budget changes. Whenever operating conditions affecting the item of cost have been changed by management since the standards and budget allowances were set, the budget allowance basis is properly adjusted. Such items as plant-wide increases, changes in manufacturing specifications, and introduction of new machinery are handled here. In this way the budget is always up to date.

Reports

There are several reports which are issued for cost control purposes but the one given to the factory foremen is probably the most interesting. A sample of the departmental budget report used is shown in Exhibit 11. Every item of cost incurred in the department, described in detail, is shown on the budget report. At the end of each year the foremen are paid a bonus equal to ten per cent of their budget savings.

In addition to the departmental budgets we also issue a summary report for the entire operation. This summary report shows only department totals, and the departments are grouped under the name of the officer responsible for their operation with a subtotal so that the vice president in charge of operations can see to what extent each subordinate is meeting his budget.

Summary

The operating budgets which I have described have the advantage of being built upon the standard costs, so that they are all part of the same system. The budget allowances are based upon the work actually performed in each of the factory departments. Flexibility is provided to absorb current changes, which is most important if budgets are to be effectively used. The reports are simple but in complete detail, and the spots which require attention stand out. Use of the annual bonus plan provides an incentive to foremen to watch costs and methods closely.

OPERATING BUDGET

F 42

Department: Yarn Preparation — Month: February 1946

Item of Cost		Account No.	Month: Actual Cost	Month: Budget Allow.	Month: Variance	Year to Date: Actual Cost	Year to Date: Budget Allow.	Year to Date: Variance
Labor:	Winder, Spool	P181	$1,692	$1,700	$ 8	$3,900	$3,910	$ 10
	Winder, Warp Spool	P182	125	140	15	284	322	38
	Threader	P160	306	290	-16	672	667	- 5
	Warper	P170	1,046	1,000	-46	2,275	2,300	25
	Jacks, Filler	P430	143	150	7	355	345	- 10
	Backwinder	G405	125	100	-25	225	230	5
	Handler	P710	358	400	42	843	908	65
	Hander-Up	G430	82	90	8	194	198	4
	Taxes, Social Security	W30	155	155		350	355	5
	Vacation Award	W15	78	80	2	175	178	3
	Total		4,110	4,105	- 5	9,273	9,413	140
Material:	Paper, Wrapping	M34.10	103	100	- 3	215	206	- 9
	Sundry Supplies	M44	15	20	5	51	45	- 6
	Total		118	120	2	266	251	-15
	Grand Total		$4,228	$4,225	$- 3	$9,539	$9,664	$125

EXHIBIT 11.

COST ACCOUNTING'S ROLE IN MANAGEMENT

by F. J. CARR, Controller,
Mallinckrodt Chemical Works, St. Louis, Mo.

THAT cost accounting is an important tool of management will probably be accepted as a fact by everyone. Many of our important decisons must be predicated upon information contained in cost reports. Past history or future forecasts may be involved, but in either case, the work of the cost accountant may influence, for good or ill, basic policy decisions.

In my opinion, there often exists on the part of both management and the cost accountant a mutual lack of understanding of each other's problems and viewpoints. The cost accountant, steeped in his problems of accumulating, distributing, and interpreting cost figures, and bound by the practices and conventions of his trade, may lack some appreciation of the use of the end result and the vital importance to management of truly correct cost figures. Management, on the other hand, looking chiefly at the end result and often having preconceived ideas of what that result should be, may fail to recognize the inherent difficulties and problems involved in the computation of the figures.

The need for correct cost information is axiomatic and yet, how often have I seen doubt and disbelief on the part of the person using the figures. How often have I heard the comment "The figures can't be right." "What is the matter?" says the manager, "You tell me it costs 98 cents a piece to make our eight-inch monkey wrench and we sell it for only a dollar. These figures can't be right." Or perhaps, "We just put in that new atomic casting machine which was guaranteed to cut our costs by twenty per cent, and you show that our castings are now costing three cents a pound more than they did before. The figures can't be right."

I recall an experience of my own some years ago when the president of my company blew up in an executive committee meeting with the statement "I get the damnedest figures around here. The engineers tell me one thing, the accountants tell me another, and I don't believe either of them."

In the whole field of accounting, this seems to apply to cost accounting more than any other branch. An income statement is accepted at its face value. Sales statistics are taken as gospel. But costs? "No sir, I don't believe them." Is it possible that you don't

want to believe them, that they have a habit of showing up unpleasant facts that you prefer not to believe? Are the figures really wrong? Or is it a matter of opinion or interpretation, or of understanding what lies behind the figures?

I do not defend the cost accountant, nor the accuracy of his figures. Surely, mistakes are sometimes made and incorrect figures may result. I do, however, want to point out some problems of the cost accountant that produce what to some may appear to be questionable results.

Lack of Uniformity

In the first place, accounting is not an exact science. It is a code of principles and practices and conventions that has developed over the years. It has proven in actual experience to be practical and to product results that reasonably represent the facts. True, it provides certain fundamental rules and techniques that are fixed, but accounting has developed and expanded far beyond the simple rule of debit and credit and questions arise that concern matters outside of the technical rules.

Have you ever tried to compare the income statements or the balance sheets of two concerns, even those in the same industry, only to find that accounts are so different as to defy comparison? What one company classifies as an expense, the other will treat as an element of cost of sales. What one includes in selling, the other may put in administrative expense. Where one will consider an item as current expense, the other will call it a surplus adjustment.

These are merely illustrations of almost countless differences that may occur. They are arrived at by the same accounting techniques. The accounting departments of both companies may be equally competent. Yet they arrive at different results. The reason is that accounting principles allow a wide latitude of application depending upon individual judgment and preferences. To the extent that companies within specific industries may get together to develop uniform practices, there is an advance toward comparability of results; but there has been hardly more than a beginning of this trend.

If this difference in application of principles is true in general accounting, how much more significant is it in cost accounting? General accounting covers broad classifications, such as cash, inventories, receivables, and fixed property. In cost accounting one gets into all the ramifications of distributions and reclassi-

fications that measurably complicate the situation and increase the opportunity for variation. Because your competitor may claim to be making screw drivers for 30 cents while your cost department says yours cost 32 cents is no sign that the figures are wrong. If you hear that your competitor's cost of making hammers is a dollar and a quarter while your cost is only a dollar, don't start patting yourself on the back. It may be a fact that your costs are higher or lower, or it may be simply a difference in accounting—perhaps in the way you respectively distribute your factory burden. But more about this distribution business later.

Accuracy of Basic Data

My next point is the obvious fact that costs are no better than the basic data from which they are compiled. Does the foreman report time distributions and is he careful to have them accurate? Or does he just turn in figures that add up to eight hours per shift? After all he is not an accountant. His job is to produce goods and not figures. He cannot be blamed for a lack of interest and perhaps some carelessness in his reports. Are material and stores inventories properly protected and correctly reported? Are the data used for burden distributions based on careful consideration and study? In a standard cost system, are the standards based on adequate facts concerning physical performance? These are types of questions, the answers to which can materially affect the soundness of the cost results.

Perhaps the most important question on this point involves the responsibility given to the cost accountant, and the authority he has to make certain that the basic data are correctly reported. He knows the importance of this matter, and he realizes the handicap resulting from his inability to secure the type of information he knows is required. Give him the chance to do a real job, and it will go a long way towards giving you more reliable costs.

Importance of Burden

Now to return to the question of distribution. The most difficult problems in cost accounting arise from this source. Direct labor and material elements can be practically exact if reporting procedures are carefully worked out and if the work is properly performed. Even in the case of burden, it is not particularly difficult to know accurately the total amounts. Account classifications are designed to furnish total costs by divisions for control purposes.

For example, you know the total payroll for factory administrative departments, or the expenditures for rent and real estate taxes, or the amount of the telephone bill. It is in trying to allocate these items to the costs of individual products that you run into differences of opinion which may lead to arbitrary decisions.

Burden may be an important or an unimportant item of cost. I have seen it run all the way from 50 per cent to 400 per cent of direct labor, or from 15 per cent to 40 per cent of total cost. Its relative importance is obviously a controlling factor in the determination of the amount of care and time that must be allowed in planning its handling and in recording its elements. If it is a small element of cost, even a large margin of error may be unimportant. If it is a major factor, it must receive greater attention.

Methods of Distribution

Methods of distribution vary from the extremely simple to the most elaborate. On the one hand, some companies distribute all burden as a simple percentage of direct labor or of prime cost, or as a simple rate applied to direct labor hours. Other companies make detailed studies of each element of overhead expense and allocate each element on some basis that reasonably accords with the facts. This is not the place to discuss at length the problems or methods of burden application. One incident will serve to illustrate the possible effect resulting from the use of different methods. A company manufactured a general line of electric cables, including rubber insulated cables. For this product, after the rubber covering was applied the cables were wound into pans which were placed on a truck and wheeled by a day laborer into the vulcanizer. The door was fastened shut and the steam turned on. After a time, the door was again opened and the trucks were wheeled out.

The company applied its overhead in one total, in which steam was included, as a percentage of direct labor. The effect was that the vulcanizing operation, having very little direct labor, received almost no charge for steam, while in fact it used almost all of the steam delivered to the department. In this case, steam was a significant element of the cost, and even casual study indicated that charging steam to the operation as a separate element was justified. By this means vulcanized cable as a product then assumed its proper proportion of steam cost. Perhaps you will say that the method originally used was rather far-fetched, but this actually happened. Granting that this is an extreme case; nevertheless a

review of your own situation may reveal that you are not without skeletons in your closet.

Changes in Procedure

My next point concerns the effect of changes in procedure. For example, comparison of cost figures today with those for the same product three years ago may result in some unexplained differences. Some of it may be due to changes in material costs, some due to increased labor rates, some due to increase in total overhead. But all these elements put together may not account for the entire difference. Some of the balance may be due to changes in cost methods. Not that anyone would recommend the elimination of changes. Cost accounting must be dynamic; it must keep up to date with new developments and new ideas. There is always room for improvement within any organization.

Where unexplained differences appear to be due to methods changes, the question to be asked is whether today's costs are better, more accurate, more in accord with the facts than yesterday's costs. If the answer is yes, then today's costs should be acceptable as the guide for today's action. After all, we cannot do anything now about yesterday's cost or the costs of three years ago. We should strive for perfection and even though comparison with past performances is an important aid to cost control, it is even more important that we be sure of our ground today.

Volume Changes and Standard Costs

Another factor that complicates comparison with past records is the influence of changes in volume. Other factors being equal, costs will be higher as volume decreases because of the failure to absorb fixed expenses. This has led to the efforts of cost accountants to separate fixed and variable expenses, so that they can be properly related to volume, and the attempts to establish costs on the basis of normal volume in order to eliminate the differentials caused by fluctuating volume. Of course, the two questions of what is normal volume and what is fixed expense are open to argument, but experience should furnish a guide in arriving at acceptable standards. Past experience alone, however, may not give the answer. I know of at least one case where a company adopted as a slogan "The Unfixing of Fixed Expenses" and succeeded in eliminating substantial amounts that in the past had always been considered fixed.

Because of these and other factors entering into the interpretation of cost figures, the modern trend is in the direction of wider adoption of standard costs. These establish costs on the basis of what they should be under a given set of circumstances. They take into account the operations at normal volume, the proper use of materials, and the expected efficiency of labor. They allow for careful analysis of overhead factors and their distribution on the basis of factual data. They are costs that do not fluctuate from period to period, but instead they throw out the inevitable fluctuation from standard through variation accounts. The latter are subject to analysis to show why expenses were more or less than standard and form the basis for effective cost control. At the same time, the cost standards should be acceptable for price determination, budget forecasting, and policy determination.

Cost of Cost Accounting

Now I come to the question of the cost of cost accounting. How much should be spent in the attempt to attain perfection? The answer to that question must be a practical one. Obviously, too much can be spent in the search for theoretical exactness. Too little may result in figures of questionable usefulness. Somewhere between these extremes must lie the answer, and the amount must be determined by the practical limitations in each case. One of my favorite college professors used to say that the chief value of a college education is that it gives one an appreciation of the relative value of data. It is this question of relative value that should influence our appraisal of the amount we should spend for cost accounting.

The story is told of the wheelbarrow manufacturer who was seeking a war contract and was asked if his equipment could work to close tolerances. His reply was made with assurance that he worked within a tolerance of a sixty-fourth of an inch. To the precision instrument manufacturer, accustomed to tolerances measured by ten-thousandths of an inch, his reply may have seemed amusing, but to the wheelbarrow manufacturer it was a perfectly sincere and adequate statement. The analogy that I want to draw is that if practical and satisfactory results in cost accounting can be attained by rough and ready methods, they are certainly the methods to be used. On the other hand, if a business is such that a fraction of a cent is significant to its competitive position, then it may require a more expensive cost procedure to make sure of the facts.

Give me everything I want and I will produce costs approaching theoretical exactness. I shall want a time sheet for every employee in the company, from the president to the day laborer and the office boy. I shall want meters on every motor, with recording devices to give me the electrical cost for every truck load of material moved about the plant. I shall want a multitude of production centers so that charges can be allocated in the finest detail. I shall want every employee to spend half of his time in paper work and a small army of cost clerks to accumulate and compile information. Even then I shall have to resort to a certain amount of expense allocation by formula. When the factory manager is negotiating a new labor agreement, what product should be charged? At some point, distributions become necessary.

Impractical, you say, impossible! Yes, I agree with you. You would go broke figuring costs under such a setup. I have deliberately dramatized the point in order to drive home the thought that cost accounting problems are practical problems that must be solved in a practical way, that the expenditure for cost information must be balanced against the value of the results to be expected. How many electric meters should you have to distribute the cost of electric current? It depends on the value of the results to be achieved. Into how many elements should overhead be divided and allocated by different formulas? It depends on the nature and significance of each item and the kind of practical basis that can be established for its allocation. Do you make a thousand items of which a hundred give you ninety per cent of your volume? Perhaps satisfactory results for practical purposes can be attained by keeping detailed costs on only the hundred items.

Yes, the cost of cost accounting is one of the problems that must receive careful consideration. Perhaps the figures are not right because you are unwilling to spend the money to make them right. On the other hand, how nearly right must they be for your particular purposes? Answer that question, and the question of expenditure very nearly answers itself.

On the other hand, I might ask how much are you spending on frills and fancy work? What work is done in the preparation of data or reports that serve no useful purpose? How often has a special report been prepared and then continued as a periodic report long after its usefulness had passed? How much information is compiled on the off chance that it might be required at

some future date? These all add to the cost of cost accounting and may represent fruitful fields for investigation. Perhaps cutting out the nonessentials may release the money to make desirable changes.

Nature of Problem

When you say "The figures can't be right," are you familiar with all of these problems and difficulties that the cost accountant faces when he prepares reports for you? Do you know what is back of the figures that he gives you? Perhaps if you would take the opportunity to discuss with your cost accountant the plans and procedures that he follows, you might get his own ideas of the things that must be done. He can tell you the practical limits within which he must work. He can usually tell you the extent to which the figures are right or wrong. He knows what changes he would like to make in order to insure more reliable results. Give him the chance to explain his problems and then give him the backing to enable him to work out their solution.

Have I strayed from the subject? Remember that the subject is "Cost Accounting's Role in Management." I believe that what I have said is at least pertinent to that subject. I might have started out in the traditional pattern by saying that in the management picture cost accounting performs five principal functions:

1. To determine periodic profits.
2. To evaluate inventories.
3. To control cost.
4. To determine selling prices.
5. To aid in budgetary planning.

I could have expounded at length on each of these functions and pointed out where cost accounting is useful or necessary in each of them. But that has been covered in great detail in talks and written articles. It has been the subject of whole meetings and conventions.

I have preferred to point out some of the underlying problems that are involved in making cost accounting serve these purposes. Obviously, the control of costs may be ineffective unless the costs are right; competitive positions may be threatened if selling prices are based on unsound costs. Hence I would shift my text from "The figures can't be right" to one that says "The figures

must be right." In order to be right they must be based on a soundly conceived plan and an accurate accumulation of data. The plan must be kept within practical limits. The inexactness of the science of accounting gives freedom and latitude to develop the plan best suited to any particular need. The methods of distribution used must be adapted to the significance of the item being distributed. Progressive changes should always be aimed toward better, more accurate, more representative results. Standard costs may be the answer to individual cases.

Conclusion

Cost accounting should be looked upon as a vital cog in the industrial machine and not as a necessary evil. Enough money should be budgeted for the cost department to do an adequate job under the particular circumstances without anything for unnecessary frills. When you look at the cost figures, recognize the limitations that surround them, and try to understand the underlying theories and practices used in their compilation. In other words, accept them for what they are, namely, a compilation of data, based partly on facts that can be directly and accurately charged to a product, and partly on facts that by their very nature must be allocated according to the conventions of cost accounting that have proven practical through the years.

The present economic situation only serves to increase the importance and value of cost data. The period of production at any price to support the war effort has given way to a renewed struggle for survival. Economic pressures abound on every side. The demands of labor, government controls, and the difficult material supply situation all contribute to the difficulties of operation and have their effect on the cost picture.

Making policy decisions may be more difficult than ever before. What effect will a wage increase have on unit costs? Should plant be expanded or contracted? What will a new product contribute to operations? Should unprofitable old products or those of low volume be dropped? Should old hand methods give way to investment in labor saving devices? Every one of these questions has its cost implications. The assurance with which you answer them will depend to a large degree upon your confidence in the cost figures. That confidence, in turn, will obviously depend upon the soundness of the cost figures themselves, but of equal importance will be your understanding of them.